



Initial Alternatives Report

Final Version, March 2005

SRWRS Partners



SACRAMENTO RIVER WATER RELIABILITY STUDY

Initial Alternatives Report, Final Version

TABLE OF CONTENTS

TABLE OF CONTENTS	I
LIST OF TABLES.....	III
LIST OF FIGURES.....	III
LIST OF ACRONYMS AND ABBREVIATIONS	IV
CHAPTER 1. INTRODUCTION	1-1
STUDY AUTHORIZATION	1-1
NEED FOR ACTION.....	1-3
STUDY AREA AND PURPOSE	1-3
REPORT ORGANIZATION.....	1-5
CHAPTER 2. RELATED STUDIES, PROJECTS, AND PROGRAMS.....	2-1
PREVIOUS PROGRAM-LEVEL STUDIES	2-1
<i>American River Water Resources Investigation</i>	2-2
<i>Sacramento Area Water Forum and the Water Forum Agreement</i>	2-2
LOCAL AND REGIONAL STUDIES, PROJECTS, AND PROGRAMS	2-3
<i>Water Forum Agreement Implementation</i>	2-3
<i>Other Related Local and Regional Studies, Projects, and Programs</i>	2-7
STATEWIDE STUDIES, PROJECTS, AND PROGRAMS	2-12
<i>Sacramento-San Joaquin River Basins Comprehensive Study (USACE, Reclamation Board)</i>	2-12
<i>Operations of CVP and SWP</i>	2-12
<i>Central Valley Project Improvement Act</i>	2-13
<i>CALFED Bay-Delta Program</i>	2-15
<i>Sacramento Valley Water Management Program</i>	2-17
CHAPTER 3. WITHOUT-PROJECT CONDITIONS.....	3-1
EXISTING CONDITIONS	3-1
<i>Flow Conditions</i>	3-1
<i>Water Quality</i>	3-3
<i>Fisheries</i>	3-4
<i>Vegetation and Wildlife</i>	3-5
<i>Land Use/Recreation</i>	3-6
<i>Aesthetics</i>	3-7
<i>Cultural Resources</i>	3-8
<i>Soils and Geology</i>	3-8
<i>Water Supply Conditions</i>	3-9
FUTURE WITHOUT-PROJECT CONDITIONS	3-13
<i>Physical Environment</i>	3-13
<i>Biological Environment</i>	3-13
<i>Social and Economic Environment</i>	3-13
CHAPTER 4. WATER AND RELATED RESOURCES PROBLEM AND OPPORTUNITIES.....	4-1
WATER SUPPLY RELIABILITY IN THE PLACER-SACRAMENTO REGION (PROBLEM)	4-1
<i>Challenges in Implementing Conjunctive Management</i>	4-1
<i>Potential Deficiency in Water Supply Reliability</i>	4-2
ENHANCEMENT OF CVP OPERATIONAL FLEXIBILITY (OPPORTUNITY)	4-2

PROMOTION OF ECOSYSTEM PRESERVATION IN THE LOWER AMERICAN RIVER (OPPORTUNITY)	4-4
COORDINATION WITH ABFSHIP FOR POTENTIAL REGIONAL BENEFITS (OPPORTUNITY)	4-5
CHAPTER 5. PLAN FORMULATION APPROACH.....	5-1
PLAN FORMULATION PROCESS.....	5-1
PLANNING OBJECTIVES	5-2
PLANNING CONSTRAINTS AND CRITERIA	5-2
<i>Planning Constraints</i>	5-3
<i>Planning Criteria</i>	5-4
CHAPTER 6. DEVELOPMENT OF PRELIMINARY ALTERNATIVES	6-1
DEVELOPMENT OF MEASURES AS PARTIAL SOLUTIONS	6-1
<i>Surface Storage Measures</i>	6-1
<i>Water Conservation and Recycling Measures</i>	6-1
<i>Groundwater Use Measures</i>	6-2
<i>Surface Water Diversion Measures</i>	6-2
<i>Combined Elkhorn/Elverta Measure for Developing Preliminary Alternatives</i>	6-4
PRELIMINARY ALTERNATIVES	6-13
<i>Elkhorn/Elverta Diversion Alternative</i>	6-13
<i>Sankey Diversion Alternative</i>	6-13
<i>Feather River Diversion Alternative</i>	6-13
<i>ARPS Alternative</i>	6-14
<i>Folsom Dam Alternative</i>	6-14
CHAPTER 7. COMPARISON OF PRELIMINARY ALTERNATIVES.....	7-1
INITIAL ANALYSES OF PRELIMINARY ALTERNATIVES	7-1
PUBLIC INPUT ON PRELIMINARY ALTERNATIVES AND STUDY DEVELOPMENT.....	7-6
SCREENING OF PRELIMINARY ALTERNATIVES	7-7
<i>Overall Assessment of Preliminary Alternatives</i>	7-7
<i>Recommended Alternatives for Further Study</i>	7-8
CHAPTER 8. NEXT STEPS IN SRWRS DEVELOPMENT	8-1
CONTINUED DEVELOPMENT OF THE SRWRS.....	8-1
<i>Next Steps</i>	8-1
<i>Potential Federal Role in Project Implementation</i>	8-2
CHALLENGES IN THE CURRENT PHASE OF SRWRS DEVELOPMENT.....	8-2
<i>Coordination with ABFSHIP</i>	8-3
<i>Determination of Basis of Comparison for Environmental Impact Assessments</i>	8-3
<i>Compliance with Authorizing Legislation</i>	8-4
STUDY SCHEDULE.....	8-5
CHAPTER 9. LIST OF PREPARERS.....	9-1
APPENDIX A: ASSESSMENT OF WATER SUPPLY NEEDS	
APPENDIX B: DEVELOPMENT OF PRELIMINARY ALTERNATIVES	
APPENDIX C: PHASE 1 ENGINEERING REPORT	
APPENDIX D: PHASE 1 ENVIRONMENTAL EVALUATION	
APPENDIX E: SCOPING REPORT	

LIST OF TABLES

TABLE ES-1. POTENTIAL FUTURE WATER SUPPLY DEFICIENCY FOR PCWA, SSWD, AND ROSEVILLE	ES-6
TABLE ES-2. PROJECTED FUTURE WATER SUPPLY DEFICIENCY FOR SACRAMENTO.....	ES-6
TABLE ES-3. WATER DELIVERY QUANTITIES CONSIDERED IN THE SRWRS BY COST-SHARING PARTNER.....	ES-8
TABLE ES-4. SUMMARY OF FACILITY PLANS FOR ALTERNATIVES RETAINED FOR FURTHER STUDY	ES-14
TABLE 2-1. COMPARISON OF MAJOR STUDY COMPONENTS	2-1
TABLE 3-1. MAJOR RESERVOIRS WITHIN THE STUDY AREA AND VICINITY	3-3
TABLE 3-2. EXISTING AUTHORIZED DIVERSIONS AND SERVICE AREAS WITHIN THE STUDY AREA	3-10
TABLE 3-3. EXISTING SURFACE WATER USE COMPARED WITH AVAILABLE WATER RIGHTS AND CONTRACT ENTITLEMENTS, BY SRWRS COST-SHARING PARTNER.....	3-12
TABLE 3-4. SUMMARY OF PROJECTED FUTURE DEMAND BY SRWRS COST-SHARING PARTNER	3-15
TABLE 3-5. SUMMARY OF PROJECTED CAPACITY NEEDS FOR SACRAMENTO.....	3-16
TABLE 3-6. SUMMARY OF WATER RIGHTS AND CONTRACT ENTITLEMENTS AND THE ASSOCIATED WFA LIMITATIONS ON DIVERSION BY COST-SHARING PARTNER	3-22
TABLE 3-7. SUMMARY OF WFA LIMITATIONS ON SACRAMENTO’S DIVERSIONS AT FAIRBAIRN WTP UNDER ITS WATER RIGHTS	3-23
TABLE 3-8. RESPONSIBILITY FOR PROVIDING REPLACEMENT WATER BY PURVEYOR AS DEFINED IN THE WFA .	3-23
TABLE 4-1. POTENTIAL FUTURE WATER SUPPLY DEFICIENCY FOR PCWA, SSWD, AND ROSEVILLE	4-3
TABLE 4-2. PROJECTED FUTURE WATER SUPPLY DEFICIENCY FOR SACRAMENTO	4-3
TABLE 5-1. WATER DELIVERY QUANTITIES CONSIDERED IN THE SRWRS	5-3
TABLE 6-1. PRELIMINARY SCREENING OF MEASURES BY COST-SHARING PARTNER.....	6-7
TABLE 7-1. SUMMARY OF INITIAL ANALYSES: INSTITUTIONAL CONSIDERATIONS	7-2
TABLE 7-2. SUMMARY OF INITIAL ANALYSES: ENGINEERING CONSIDERATIONS	7-3
TABLE 7-3. SUMMARY OF INITIAL ANALYSES: ENVIRONMENTAL CONSIDERATIONS	7-4
TABLE 7-4. SUMMARY OF FACILITY PLANS FOR ALTERNATIVES RETAINED FOR FURTHER STUDY.....	7-10

LIST OF FIGURES

FIGURE ES-1. SRWRS STUDY AREA.....	ES-3
FIGURE ES-2. JOINT SRWRS-ABFSHIP ELVERTA DIVERSION ALTERNATIVE.....	ES-15
FIGURE ES-2. TENTATIVE SCHEDULE FOR SRWRS DEVELOPMENT.....	ES-17
FIGURE 1-1. SRWRS STUDY AREA MAP	1-4
FIGURE 3-1. SRWRS STUDY AREA AND VICINITY MAP	3-2
FIGURE 3-2. 1998 GROUNDWATER SURFACE ELEVATIONS WITHIN THE SRWRS STUDY AREA.....	3-11
FIGURE 3-3. PCWA SERVICE AREAS	3-17
FIGURE 3-4. SSWD SERVICE AREAS.....	3-18
FIGURE 3-5. ROSEVILLE SERVICE AREAS	3-19
FIGURE 3-6. SACRAMENTO SERVICE AREAS	3-20
FIGURE 3-7. MAP OF KNOWN MAJOR CONTAMINATION IN SACRAMENTO COUNTY (SOURCE: SCWA, 2004, ZONE 40 GROUNDWATER MANAGEMENT PLAN)	3-24
FIGURE 5-1. PHASES OF SRWRS DEVELOPMENT AND CORRESPONDING FOCUS.....	5-2
FIGURE 6-1. POTENTIAL SURFACE WATER DIVERSION LOCATIONS FOR THE COST-SHARING PARTNERS	6-5
FIGURE 6-2. PRELIMINARY ALTERNATIVE: ELKHORN/ELVERTA DIVERSION ALTERNATIVE.....	6-15
FIGURE 6-3. PRELIMINARY ALTERNATIVE: SANKEY DIVERSION ALTERNATIVE	6-16
FIGURE 6-4. PRELIMINARY ALTERNATIVE: FEATHER RIVER DIVERSION ALTERNATIVE.....	6-17
FIGURE 6-5. PRELIMINARY ALTERNATIVE: ARPS ALTERNATIVE.....	6-18
FIGURE 6-6. PRELIMINARY ALTERNATIVE: FOLSOM DAM ALTERNATIVE	6-19
FIGURE 7-1. SRWRS ELVERTA DIVERSION ALTERNATIVE.....	7-11
FIGURE 7-2. JOINT SRWRS-ABFSHIP ELVERTA DIVERSION ALTERNATIVE	7-13
FIGURE 7-3. ARPS-ELVERTA DIVERSION ALTERNATIVE	7-15
FIGURE 7-4. ARPS-JOINT SACRAMENTO-ABFSHIP ELVERTA DIVERSION ALTERNATIVE	7-17
FIGURE 8-1. TENTATIVE SCHEDULE FOR SRWRS DEVELOPMENT.....	8-6

LIST OF ACRONYMS AND ABBREVIATIONS

400/670	minimum of 400,000 AF and maximum of 670,000 AF of flood control storage space in Folsom Reservoir
°F	degrees Fahrenheit
µg/L	microgram per liter
ABFSHIP	American Basin Fish Screen and Habitat Improvement Project
AF	acre-feet
AFB	Air Force Base
AFRP	Anadromous Fish Restoration Program
AFSP	Anadromous Fish Screen Program
ARBCA	American River Basin Cooperating Agencies
ARBCUP	American River Basin Conjunctive Use Program
AROG	American River Operation Work Group
ARPS	American River Pump Station
ARWRI	American River Water Resources Investigation
ASIP	Action Specific Implementation Plan
BA	Biological Assessment
BMP	best management practice
BO	Biological Opinion
CALFED	CALFED Bay-Delta Program
CBDA	California Bay-Delta Authority
CDFG	California Department of Fish and Game
CEPA	California Environmental Protection Agency
CEQA	California Environmental Quality Act
cfs	cubic feet per second
COA	Coordinated Operations Agreement
Comprehensive Study	Sacramento-San Joaquin River Basins Comprehensive Study
CSCGF	Central Sacramento County Groundwater Forum
CVP	Central Valley Project
CVPIA	Central Valley Project Improvement Act
CWA 404 Permit	Section 404 of the Clean Water Act Permit
Delta	Sacramento-San Joaquin Delta
DHS	Department of Health Services
DWR	California Department of Water Resources
D-xxxx	SWRCB Decision-xxxx
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
ERP	Environmental Restoration Program
ESA	Endangered Species Act
EWA	Environmental Water Account
Fairbairn WTP	E. A. Fairbairn Water Treatment Plant
FMS	flow management standard

Folsom	City of Folsom
HCP	Habitat Conservation Plan
IGSM	Integrated Ground Water and Surface Water Model
Interim Agreement	Contract Between the United States of America and the Sacramento Area Flood Control Agency Concerning the Operation of Folsom Dam and Reservoir
JPA	joint powers authority
JPOD	Joint Point of Diversion
Lincoln	City of Lincoln
LOD	level of development
M&I	municipal and industrial
max-day demand	maximum-day demand
MCL	maximum contaminant level
MFP	Middle Fork Project
mgd	million gallons per day
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MOU Area	Roseville/Placer County Memorandum of Understanding Area
msl	mean sea level
NAPA Proposition	Draft Proposition Concerning CVP/SWP Integrated Operation
NBHCP	Natomas Basin Habitat Conservation Plan
NCC	Natomas Cross Canal
NCCP	Natural Communities Conservation Plan
NEPA	National Environmental Policy Act
NMWC	Natomas Mutual Water Company
NOAA Fisheries	National Marine Fisheries Service of National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NOP	Notice of Preparation
OCAP	Operations Criteria and Plan
P&G	Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies
Parkway	American River Parkway
PCWA	Placer County Water Agency
PEIS	Programmatic Environmental Impact Statement
PG&E	Pacific Gas and Electric Company
PL	Public Law
POU	Place of Use
PR	Planning Report
Program EIR	Program Environmental Impact Report on Flood Control Improvements Along the Mainstem of the American River
PSA	Purveyor-Specific Agreement in the WFA
Reclamation	Bureau of Reclamation
RM	river mile
ROD	Record of Decision

Roseville	City of Roseville
RWA	Regional Water Authority
RWMP	Regional Water Master Plan (developed by ARBCA)
SacLAFCo	Sacramento County Local Agency Formation Commission
SACOG	Sacramento Area Council of Governments
Sacramento	City of Sacramento
SAFCA	Sacramento Area Flood Control Agency
SDIP	South Delta Improvement Program
SGA	Sacramento Groundwater Authority
Short-Term Settlement Agreement	Short-Term Agreement to Guide Implementation of Short-Term Water management Actions to Meet Local Water Supply Needs and to Make Water Available to the SWP and CVP to Assist in Meeting the requirements of the 1995 Water Quality Control Plan and to resolve Phase 8 Issues
SIR	Supplemental Information Report
SCWA	Sacramento County Water Agency
SJWD	San Juan Water District
SMUD	Sacramento Municipal Utility District
SMWA	Sacramento Metropolitan Water Authority, now Regional Water Authority
SOI	sphere of influence
SRA	State Recreation Area
SRWRS	Sacramento River Water Reliability Study
SSHCP	South Sacramento Habitat Conservation Plan
SSWD	Sacramento Suburban Water District
SVWMP	Sacramento Valley Water Management Program
SWP	State Water Project
SWRCB	State Water Resources Control Board
TAF	thousand acre-feet
TCD	temperature control device
TCE	trichloroethylene
Upstream Water Users	more than 40 water suppliers in the Sacramento Valley who signed a December 2002 Short-Term Settlement Agreement
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VOC	volatile organic compound
Water Forum	Sacramento Area Water Forum
Water Forum year types	American River basin water year types defined in the WFA
WEP	Water Efficiency Plan
WFA	Water Forum Agreement
WFP	Water Forum Proposal
WQCP	1995 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary
WRDA	Water Resources Development Act
WTP	water treatment plant
YCWA	Yuba County Water Agency